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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,099	01/21/2004	David M. Anderson	200309413-1	4568

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EXAMINER	
FERNANDEZ RIVAS, OMAR F	
ART UNIT	**PAPER NUMBER**
2129	

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/762,099	ANDERSON ET AL.	
	Examiner	Art Unit	
	Omar F. Fernández Rivas	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *A1*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-29 are pending on this application.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The computer system must set forth a practical application of judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to a substantial practical application.

For a claimed invention to be statutory the claimed invention must produce a useful, concrete, and tangible result. The Courts have found that subject matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable. See, e.g., *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. (20 Wall.) 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Warmerman*, 33 F.3d at 1360, 31 USPQ2d at 1759.

For a claimed invention to be statutory under 35 U.S.C. 101, the claims must have the FINAL RESULT (not the steps) produce a useful (specific, substantial, AND credible), concrete (substantially repeatable/ non-unpredictable), AND tangible (real world/ non-abstract) result.

If the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended. A claim that recites a computer that solely calculates a mathematical formula is not statutory.

In the present case, claim 1 describes a system for applying a genetic algorithm to a set of chromosomes to obtain child chromosomes. The claim describes the steps taken by the system while performing the genetic algorithm and how to the child chromosomes are produced. However, the claim fails to provide a useful and tangible result since the result obtained by the system is not provided to an outside device to make it useful or presented to a user in such a way that it can be perceived and used by the user. The result is kept inside the system, which is considered to be manipulation of abstract data inside a computer and thus not a real world/non-abstract (tangible) result. Claims 2-11 further describe the steps taken by the system to produce the child chromosomes but fail to solve the abstractness issue of claim 1 and are therefore rejected on the same basis.

Claims 12-21 describe a method for performing a function similar to that of the system of claims 1-11 and lack tangibility as set forth above regarding claims 1-11. Therefore, claims 12-21 are rejected on the same basis as claims 1-11.

Claims 22-25 describe a method for performing a function similar to that of claims 1-11 and lack tangibility as set forth above regarding claims 1-11. Therefore, claims 22-25 are rejected on the same basis as claims 1-11.

Claims 26-29 describe a system for performing a function similar to that of claims 1-11 and lack tangibility as set forth above regarding claims 1-11. Therefore, claims 26-29 are rejected on the same basis as claims 1-11.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Anderson (US Patent #6,766,497, referred to a **Anderson**).

Claim 1

Anderson anticipates a plurality of value sets represented as a plurality of real chromosomes (**Anderson**: C1, L20-25; C2, L56-62; Fig. 2, item 205); a genetic algorithm that generates at least one generation of speculative chromosomes, the speculative chromosomes representing value set variations of the plurality of value sets, each generation of speculative chromosomes being assigned a speculative count corresponding to a speculative chromosome generation (**Anderson**: C3, L6-19; C3,

L20-26; C4, L12-33; Figs. 2 and 5; Examiner's Note (EN): child chromosomes are speculative chromosomes. N is the number of children desired. In item 230 of figure 2, C is the count of children that has been generated (speculative count)); and a validator that initiates a validation once at least one speculative chromosome has a predetermined speculative count (**Anderson**: C3, L20-38; Fig 2, items 230, 235, 240; simulating and evaluating the child chromosomes when C=N) .

Claims 2 and 13

Anderson anticipates a real cost function that determines real costs for the plurality of real chromosomes (**Anderson**: C2, L52-67; C3, L1-6; C6, L45-57; Fig. 2, item 210; EN: the score is the real cost function), and an incremental cost function that determines speculative costs for speculative chromosomes (**Anderson**: C1, L36-41; C3, L28-30; Fig. 2; EN: evaluating each child chromosome and assigning a score is determining an incremental cost function).

Claim 3

Anderson anticipates executing the real cost function on the at least one speculative chromosome to provide a real cost associated with the at least one speculative chromosome (**Anderson**: C3, L28-38; Fig. 2; EN: simulating the child chromosome and assigning a score is executing the real cost function on the child).

Claims 4 and 17

Anderson anticipates the genetic algorithm generates a speculative child chromosome from at least one of a first parent chromosome and a second parent chromosome (**Anderson**: C4, L34-36; C5, claim 1; Fig. 6), wherein the speculative child

chromosome is assigned a speculative count that is higher than the speculative count of the parent chromosome having the higher speculative count (**Anderson**: C3, L20-38; Fig. 2, item 230; EN: the number C is assigned in each iteration to each child produced; the count for each child produced will be higher than the count for any of the parents).

Claim 5

Anderson anticipates the at least one of a first parent chromosome and a second parent chromosome is selected from at least one of the plurality of real chromosomes and subsequent generations of speculative chromosomes (**Anderson**: C3, L32-38; EN: beginning a new mating season with the updated chromosome pool will select parents from the original chromosome pool (real chromosomes) and from the child chromosomes (speculative chromosomes)).

Claim 6

Anderson anticipates a speculation counter that increments for each new generation of speculative chromosomes generated by the genetic algorithm (**Anderson**: C3, L20-24; Fig. 2, item 230; EN: the value C is a control variable controlling the loop, it must be incremented on each iteration).

Claim 7

Anderson anticipates the validator initiates a validation on at least one speculative chromosome when the speculation counter has achieved a count value equal to the predetermined speculative count (**Anderson**: C3, L20-24; Fig. 2, items 230, 235, 240 and 245; EN: assigning scores and evaluating the children after C=N).

Claim 8

Anderson anticipates a speculative pool that stores speculative chromosomes and assigned speculative counts (**Anderson**: C3, L20-28; Fig. 2; EN: generating N children is generating a speculative pool).

Claim 9

Anderson anticipates the validator initiates a validation once at least one speculative chromosome in the speculative pool has a predetermined speculative count (**Anderson**: C3, L20-24; Fig. 2; EN: the validation will start when C=N).

Claims 10 and 21

Anderson anticipates the validator initiates a validation on the entire speculative pool once at least one speculative chromosome in the speculative pool has a predetermined speculative count (**Anderson**: C3, L20-38; Fig. 2; EN: all of the children are processed in parallel when C=N).

Claim 11

Anderson anticipates the plurality of value sets being a plurality of circuit configurations generated by an optimization tool (**Anderson**: C2, L56-67, C3 L1-6).

Claims 12 and 22

Anderson anticipates determining real costs for a plurality of real chromosomes that represent a plurality of value sets (**Anderson**: C2, L52-67; C3, L1-6; C6, L45-57; Fig. 2, item 210; EN: the score is the real cost function); generating at least one generation of speculative chromosomes that represent value set variations of the plurality of value sets (**Anderson**: C3, L6-19; C3, L20-26; C4, L12-33; Figs. 2 and 5;

Examiner's Note (EN): child chromosomes are speculative chromosomes); assigning a speculative count to speculative chromosomes based on a corresponding generation of the speculative chromosome (**Anderson**: C3, L6-19; C3, L20-26; C4, L12-33; Figs. 2 and 5; Examiner's Note (EN): N is the number of children desired. In item 230 of figure 2, C is the count of children that has been generated (speculative count) assigned to each generation of child chromosome); approximating speculative costs for the speculative chromosomes (**Anderson**: C1, L36-41; C3, L28-30; Fig. 2; EN: evaluating each child chromosome and assigning a score is approximating a speculative cost function); and repeating the generating of speculative chromosome generations, assigning speculative chromosomes and approximating speculative costs, until at least one speculative chromosome has a predetermined speculative count (**Anderson**: C3, L20-38; Fig. 2).

Claim 14

Anderson anticipates the execution of the real cost function comprising optimizing a circuit design, and the plurality of value sets being a plurality of circuit configurations generated by the optimization (**Anderson**: C2, L56-67, C3 L1-6; Fig. 2).

Claim 15

Anderson anticipates the speculative chromosomes representing speculative file databases that are circuit configuration variations of real file data bases, each real file data base defines a circuit configuration (**Anderson**: C2, L56-67, C3 L1-38; Fig. 2).

Claim 16

Anderson anticipates executing a genetic algorithm that employs parent chromosomes selected from at least one of real chromosomes and speculative chromosomes (**Anderson**: C3, L6-38; Fig. 2; EN: beginning a new mating season with the updated chromosome pool will select parents from the original chromosome pool (real chromosomes) and from the child chromosomes (speculative chromosomes)).

Claim 18

Anderson anticipates incrementing a speculation counter for each new generation of speculative chromosomes (**Anderson**: C3, L20-24; Fig. 2, item 230; EN: the value C is a control variable controlling the loop, it must be incremented on each iteration), a validation being initiated when the speculative counter has a predetermined speculative count (**Anderson**: C3, L20-38; Fig. 2, items 230, 235, 240 and 245; EN: assigning scores and evaluating the children after C=N).

Claims 19 and 28

Anderson anticipates executing a validation of the at least one speculative chromosome when at least one speculative chromosome has a predetermined speculative count, the validation comprising executing a real cost function on the at least one speculative chromosome to provide a real cost associated with the at least one speculative chromosome (**Anderson**: C3, L20-38; Fig. 2; EN: simulating the children to assigning scores and evaluating the children after C=N).

Claim 20

Anderson anticipates storing speculative chromosomes and associated speculative counts in a speculative pool (**Anderson**: C3, L20-28; Fig. 2; EN: generating N children is generating a speculative pool), a validation being initiated when a speculative chromosome in the speculative pool has a predetermined speculative count (**Anderson**: C3, L20-38; Fig. 2).

Claims 23 and 27

Anderson anticipates approximating costs associated with speculative chromosomes in each speculative chromosome generation (**Anderson**: C1, L32-41; Fig. 2; EN: assigning a score to the child chromosome).

Claim 24

Anderson anticipates determining real costs associated with at least one speculative chromosome once at least one speculative chromosome has a predetermined speculative count (**Anderson**: C3, L20-38; Fig. 2; EN: simulating each child chromosome and assigning scores when C=N).

Claim 25

Anderson anticipates storing a plurality of speculative chromosomes in a speculative pool (**Anderson**: C3, L20-28), and determining real costs associated with the entire pool once at least one speculative chromosome in the speculative pool has a predetermined speculative count (**Anderson**: C3, L20-38; Fig. 2; EN: all of the children are processed in parallel when C=N and assigned a score based on the simulation).

Claim 26

Anderson anticipates means for determining real costs associated with a plurality of real chromosomes (**Anderson**: C2, L52-67; C3, L1-6; C6, L45-57; Fig. 2, item 210; EN: the score is the real cost function); means for generating generations of speculative chromosomes with assigned speculative counts corresponding to a generation number of the speculative chromosome (**Anderson**: C3, L6-19; C3, L20-26; C4, L12-33; Figs. 2 and 5; Examiner's Note (EN): N is the number of children desired. In item 230 of figure 2, C is the count of children that has been generated (speculative count) assigned to each generation of child chromosome), the speculative chromosome being assigned a speculative count that is higher than a parent chromosome from which it is derived (**Anderson**: C3, L20-38; Fig. 2, item 230; EN: the number C is assigned in each iteration to each child produced; the count for each child produced will be higher than the count for any of the parents); and means for postponing validation of at least one speculative chromosome, until at least one speculative chromosome has a predetermined speculative count (**Anderson**: C3, L20-38; Fig. 2; Simulating and assigning scores to the children after C=N).

Claim 29

Anderson anticipates the means for validating executing the means for determining a real cost on a plurality of speculative chromosomes retained in a speculative pool (**Anderson**: C3, L20-38; Fig. 2; EN: the N child chromosomes in the pool are simulated in parallel and assigned scores).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

De Lacharriere et al, U.S. Patent Application 10/446, 926

Scarborough et al U.S. Patent Application 09/922, 197

Brady et al U.S. Patent 6, 167, 390

8. Claims 1-29 are rejected.

Correspondence Information

9. Any inquires concerning this communication or earlier communications from the examiner should be directed to Omar F. Fernández Rivas, who may be reached Monday through Friday, between 8:00 a.m. and 5:00 p.m. EST. or via telephone at (571) 272-2589 or email omar.fernandezrivas@uspto.gov.

If you need to send an Official facsimile transmission, please send it to (571) 273-8300.

If attempts to reach the examiner are unsuccessful the Examiner's Supervisor, David Vincent, may be reached at (571) 272-3080.

Hand-delivered responses should be delivered to the Receptionist @ (Customer Service Window Randolph Building 401 Dulany Street Alexandria, VA 22313), located on the first floor of the south side of the Randolph Building.

Omar F. Fernández Rivas
Patent Examiner
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Patent & Trademark Office

Tuesday, April 04, 2006

OFR